

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
25 August 2005 (25.08.2005)

PCT

(10) International Publication Number
WO 2005/077106 A2

(51) International Patent Classification: **Not classified**

(21) International Application Number:
PCT/US2005/004484

(22) International Filing Date: 9 February 2005 (09.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/543,004 9 February 2004 (09.02.2004) US

(71) Applicant (for all designated States except US): **NORTH-EASTERN UNIVERSITY** [US/US]; 360 Huntington Avenue, Boston, MA 02115 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **TAKACS, Laszlo**

[US/US]; 816 Pamela Wood Street, Newbury Park, CA 91320 (US). **GUTTMAN, Andras** [US/US]; 12525 Maestro Court, San Diego, CA 92103 (US). **HANCOCK, William, S.** [US/US]; 39 Chatham Street, Brookline, MA 02446 (US). **KARGER, Barry, L.** [US/US]; 62 Deborah Road, Newton, MA 02459 (US). **DUVAL, Manuel** [FR/US]; 11 Woodlawn Road, New London, CT 06320 (US). **BERNA, Patrick** [FR/FR]; 20 Rue De La Colonie, F-27600 Gaillon (FR).

(74) Agents: **HEINE, Holliday, C.** et al.; Weingarten, Schurigin, Gagnebin & Lebovici LLP, Ten Post Office Square, Boston, MA 02109 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,

[Continued on next page]

(54) Title: MONOCLONAL ANTIBODY BASED BIOMARKER DISCOVERY AND DEVELOPMENT PLATFORM

BIOMARKER DISCOVERY PLATFORM

Collection of analytes: e.g., plasma samples Enrichment for, e.g., low abundance and specific proteins
Generation of hybridoma supernatants (mAb candidates)
Prevalidation: biomarker hit generation via throughput screening of hybridoma supernatants (mAbs)
Large scale protein ID by nanovolume integrated mass spectrometry
Bioinformatics, bioanalysis, hypothesis building, candidate selection for further validation steps - data integration
Biomarker lead generation: screening on clinical collection

(57) Abstract: A method or platform for monoclonal antibody based biomarker discovery is disclosed. The method according to the invention provides for the integration of analyte collection, hybridoma screening and nanovolume integrated mass spectrometry (NVIMS) to achieve a robust screening system that is capable, for example, of cutting 4-6 years off of the classical biomarker discovery and development process. The invention provides a platform for the rapid, high-throughput production, isolation and characterization of, e.g., disease specific biomarkers together with highly specific monoclonal antibodies. The method of the invention has a variety of applications such as, but not limited to, drug testing, biohazard applications, ecological applications, physiological applications and/or pathology screening applications. The method of the invention is also capable of being performed or used as or with a high-throughput screening process or system of the invention.

WO 2005/077106 A2



PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

- (84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM,

PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- of inventorship (Rule 4.17(iv)) for US only

Published:

- without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.